



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/725,622	12/02/2003	Stefan Assmann	P03,0479	4948

7590 04/19/2007  
SCHIFF HARDIN & WAITE  
Patent Department  
6600 Sears Tower  
233 South Wacker Drive  
Chicago, IL 60606

EXAMINER

SOLANKI, PARIKHA

ART UNIT PAPER NUMBER

3737

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	04/19/2007	PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.



## DETAILED ACTION

### *Response to Arguments*

1. Applicant's arguments filed 27 February 2007 have been fully considered but they are not persuasive. With regards to claims 1-12, Applicant argues that Dumoulin (European Patent Application No. 375,314) fails to obtain more than a single anatomical image, which does not fully anticipate the claimed "anatomical image series" recited in claim 1 of the instant application.

In response to these arguments, Examiner respectfully draws Applicant's attention to the following excerpts from Dumoulin ('314) (emphasis added):

"It will be seen that... **a series of two-dimensional slices**, or projections, of the entire three-dimensional volume can be presented..." (p. 8 lines 3-4)

It would not be possible for one of reasonable skill in the art to present an entire composite three-dimensional image volume, as recited by Dumoulin ('314), from a single two-dimensional stationary tissue image slice, and therefore the invention of Dumoulin ('314) must necessarily include means and steps for acquiring a series of stationary tissue images as claimed in the instant application.

Applicant further states that the instant application claims "two dynamic series of images," one of which is a "dynamically changing moving (flowing) spin image series," which Examiner interprets as a suggestion or argument that these features distinguish the claimed invention from the prior art of record (Remarks 2/27/07, p. 9 ¶2). It is noted that the features upon which Applicant relies (i.e., a "dynamic" image series and a "dynamically changing moving (flowing) spin" image series) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

Accordingly, Examiner maintains the previous rejection of claims 1-12 in view of Dumoulin ('314), the arguments of which are reiterated below.

### *Claim Rejections - 35 USC § 102*

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

Art Unit: 3737

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1, 4-6, 9, 11 and 12 are rejected under 35 U.S.C. 102(b) as being anticipated by Dumoulin et al (European Patent Application No. 375,314), hereinafter Dumoulin ('314).

Regarding claims 1, 4-6 and 9, Dumoulin ('314) discloses a method for simultaneously obtaining a three-dimensional nuclear magnetic resonance image of fluid flow during a movement cycle in a selected sample region and a three-dimensional magnetic resonance image of stationary tissue in the same region of a living subject, including steps for superimposing the time-corresponding stationary and flow image in a composite image (Abstract, p. 2 lines 46-48, p. 7 line 49 – p.8 line 1). The fluid flow image of Dumoulin ('314) is the same as the speed-resolved image described in the instant application. Dumoulin ('314) includes steps for applying phase-encoded gradients to the magnetic field during the imaging procedure so as to acquire images with fluid movement information, which is the same as the speed-resolved image claimed in the instant application (p. 7 lines 19-48). Dumoulin ('314) further provides a step for color-coding the data in the fluid flow image to indicate flow direction (p. 8 lines 1-5). Dumoulin ('314) discloses this imaging method for the purpose of obtaining angiographic images (Abstract line 1). By definition, angiographic imaging is performed over the duration of a heart cycle. At the time of invention, state of the art nuclear magnetic resonance imaging methods inherently produced cine images, equivalent to the movie of claim 6 of the instant application.

Regarding claim 6, Dumoulin ('314) states that the entire imaging method may be applied to a series of two-dimensional images of the same selected region, which constitutes a movie as claimed in the instant application (Figs. 3 & 4a).

Regarding claim 7, Dumoulin ('314) discloses that the method of imaging is applied to angiographic imaging of fluid flow, which is the same as manually identifying the region to be imaged as claimed in the instant application (Fig. 4b, Abstract).

Regarding claim 8, Dumoulin ('314) discloses that a plurality of two-dimensional image data sets from adjacent anatomical slices is acquired to form a composite three-dimensional image, where each two-dimensional image contains fluid flow information, and where the two-dimensional image sets are the same as the plurality of regions within a selected region as claimed in the instant application (Figs. 3 & 4a).

Regarding claims 11 and 12, Dumoulin ('314) provides an imaging system including a magnetic resonance scanner, a control computer, a display screen, a control computer, and a computer program loadable onto a computer-readable medium capable of simultaneously acquiring data for and displaying

Art Unit: 3737

images of stationary tissue and flowing fluid in the same selected region of a living subject (Figs. 5-10, p. 8 lines 20-58).

***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 2 and 3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dumoulin ('314), in view of Applicant's admitted prior art. Dumoulin ('314) discloses all features of the present invention as described in paragraph 5 of this Office Action, with the exception of discussing image segmentation. Applicant admits that segmentation of medical images is well-known in the art, on page 4, line 20 of the specification of the instant application. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to include commonly-known image segmentation techniques in the method of Dumoulin ('314), in order to better distinguish the anatomical areas of interest from the background of the acquired image.

6. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Dumoulin (European '314). Dumoulin ('314) discloses all features of the invention claimed in claim 1 of the instant application, as described in paragraph 5 of this Office Action. Dumoulin ('314) does not explicitly state that 20 images are acquired per movement cycle. One of ordinary skill in the art at the time of invention would find it obvious to perform the method of Dumoulin ('314) by acquiring at least 20 images during the cardiac cycle of the patient, as it is known in the art to choose the number of acquired image data sets so as to obtain an accurate and comprehensive set of image data representing the changes in blood flow during a cardiac cycle.

***Conclusion***

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Dumoulin et al (US Patent No. 4,918,386) teach a related method of simultaneously imaging blood flow with stationary tissue. Cline et al (US Patent No. 5,204,625) provide a related method of segmenting

Art Unit: 3737

stationary vascular images. Pelc et al (US Patent No. 5, 257, 625), Ehnholm et al (US Patent No. 5, 315, 250) and Alley et al (US Pat. No. 6, 185, 447) show that state of the art NMR imaging systems and methods generate cine images.


8. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Parikha Solanki whose telephone number is 571.272.3248. The examiner can normally be reached on M-F, 8 - 4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Brian Casler can be reached on 571.272.4956. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

  
Parikha Solanki  
Examiner – Art Unit 3737

  
BRIAN L. CASLER  
SUPERVISORY PATENT EXAMINER  
ELECTRONIC BUSINESS CENTER 3700